THE IDRC PALMWOOD UTILIZATION RESEARCH NETWORK IN ASIA

COCONUT PALM

SUGAR PALM

CANADA

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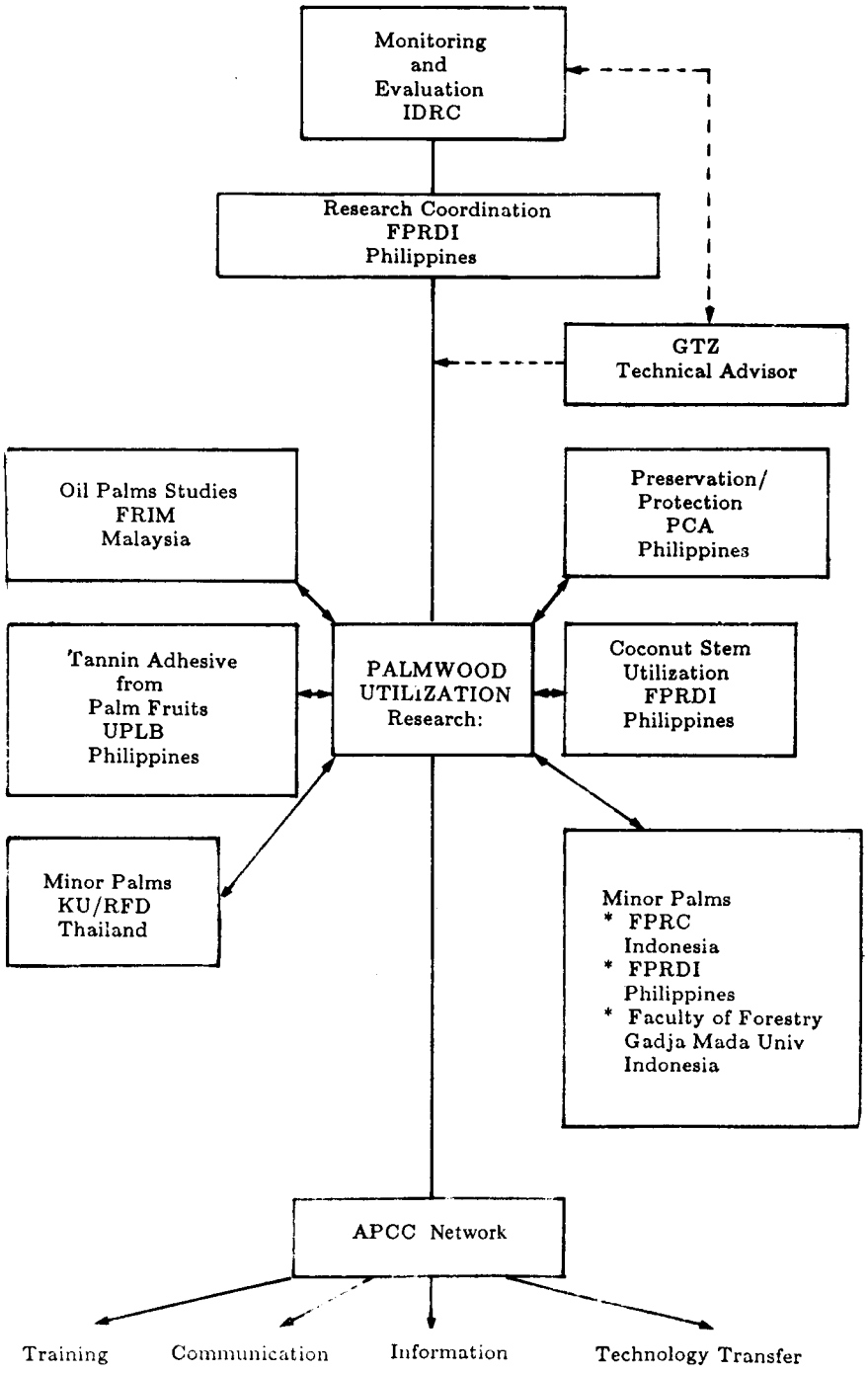
IDRC Palmwood Utilization Research Network



Structure of the IDRC palmwood utilization research network in Asia

THE IDRC PALMWOOD UTILIZATION RESEARCH NETWORK IN ASIA

This bulletin provides some important information on the projects/studies of the Palmwood Utilization Program (Asia).

BACKGROUND

Palms are the third most important plant group in the world, surpassed only by grasses and legumes in importance. They thrive mostly in the tropics and are the bases of gigantic industries that provide income to millions. Examples of these are the coconut and palm oil industries of Southeast Asia.

Peoples throughout the world have exploited the palms for their many uses. At least 20 wild palm species, for instance, are exploited in commercial quantities for seed oil, starch, fiber, fruits, wax and rattan canes. On the other hand, natural stands of palms have multiple uses for local people, especially the rural poor.

Though palms are used extensively throughout the world, it is in Asia – home to many of the 2,700 palms species – where they have been used the longest.

However, only the traditionally popular parts of the palm, such as the fruit, and the seed. are fully utilized. Some parts, such as the stem, have yet to be exploited to the fullest. In many parts of Asia, for example, it is used mainly as fuelwood and material for housing components. Wood technologists believe that current modes of palmwood processing and utilization could still be vastly improved.

GENERAL OBJECTIVE

The program aims (1) to investigate and develop techniques for the utilization of the palm stem and (2) to promote its processing and use by small and medium scale industries in the Asia – Pacific Region.

Specific Objectives:

Project 1. Coconut Stem Utilization (Philippines)

1. Assess the availability of palm stems in the region;
2. Improve sawing techniques using a two-man ripsaw;

3. Investigate the technical and economic viability of coconut wood cement board production; and
4. Disseminate reasearch-based information and technologies to potential end-users.

Project 2. Oil Palm Stem Utilization (Malaysia)

1. Assess the availability of oil palm in the region;
2. Determine the technical and economic viability of converting oil palm stem into cement-bonded boards;
3. Develop a technique of separating the vascular and parenchymatous portion of the stem; and
4. Disseminate research-based information and technologies to potential end-users.

Project 3. Dissemination of Information and Technology Transfer (Indonesia)

1. Conduct a survey on the needs of potential users of palmwood;
2. Disseminate research-based information and technologies on palmwood utilization to potential end-users;
3. Produce a video documentary on the different processing techniques and multiple uses of palmwoods and distribute copies of this to potential users; and
4. Produce a bibliography on palmwood.

roject 4. Other Palm Stem Utilization (Thailand)

1. Assess the availability of *Oncosperma and Borassus spp.* in the region;
2. Evaluate the anatomical, physical and strength properties of the palms;
3. Study their sawing, drying, machining characteristics; and
4. Determine the distribution, utilization and economic importance of these palms in rural communities.

Project 5. Tannin adhesive from Palm Fruits (*Areca spp*) Philippines

1. Develop the technique of converting areca fruit into wood adhesive;
2. Test, evaluate and compare the adhesive properties of areca fruit; and
3. Determine other possible uses of areca such as dentifrice and medicinal applications.

Project 6. Prophylactic Treatment of Coconut Wood (Philippines)

1. Evaluate the effects of various anti-sapstain chemicals for the protection of freshly sawn coconut lumber against molds and stain: and

2. Determine the economic viability of these chemicals.

Project 7. Anatomical Variation, Chemical, Physical and Mechanical Properties of Anahau and Buri

1. Determine the anatomical, chemical, physical and mechanical properties of anahau and buri; and
2. Correlate the different properties with their anatomical characteristics.

Project 8. Sago Properties and its Utilization (Indonesia)

1. Study the anatomical properties of sago wood;
2. Test and determine the physical and mechanical properties of this species; and
3. Evaluate other potential uses of sago palm wood.

Project 9. Program Coordination (Philippines)

1. Coordinate research and development activities on the various projects;
2. Upgrade the researchers' capabilities on palm utilization in the region.

PROJECTS

Coconut Stem Utilization (Philippines)

Project Leader	:	**DR. FLORENTINO O. TESORO** **Director, Forest Products Research and Development Institute**
IDRC Grant	:	**$73,900 CAD**
Duration	:	**3 years**

The project, which started in September 1987, aims to (1) fill in gaps in coconut stem research and utilization and (2) promote its wider use in the rural areas through the establishment of small and medium-scale industries. The project includes studies on: (1) the availability and distribution of coconut palms in the country, (2) the improvement of the two-man ripsaw for log break-down, (3) the production of cement-bonded boards and (4) the transfer of some coconut processing technologies to end-users.

Oil Palm Stem Utilization (Malaysia)

Associate Project Leader	:	**DR. ABDUL RAZAK MOHD. ALI** **Director, Chemistry Division** **Forest Research Institute of Malaysia (FRIM)**
IDRC Grant	:	**$75,000 CAD**
Duration	:	**3 Years**

The main objective of the project is to study the technical and economic viability of converting oil palm stems into cement-bonded boards. It will also study the procedure of separating the palm stem material into the vascular

bundles and the parenchymatous portion. The fibers are eyed for particleboard or pulp production, while the parenchymatous portion is eyed as source of animal feeds.

Other Palm Stem Utilization (Thailand)

Project Leader	:	**DR. BUHNNUM KYOKONG** **Faculty of Forestry** **Kasetsart University (KU)**
IDRC Grant	:	**$92,000 CAD**
Duration	:	**3 years**

The main objective of this project is to assess the availability of *Oncosperma* and *Borassus* spp. and to evaluate their properties to determine their potential uses. The "lao-cha-own" palm grows naturally in the south and some in the eastern part of Thailand. *Oncosperma tiquillaria* grows in brackish water near the coast forming extensive stemmed clumps along the edge of mangrove forests. *Oncosperma horrida* grows solitarily in inland hillsides while *Borassus* are concentrated mainly in the central part of Thailand, with the highest density in Petcheburi Province. The anatomical, physical, mechanical properties as well as durability of the two species are being studied. Sawing methods as well as seasoning properties of the said palm species are also being determined.

Dissemination of Information and Technology Transfer (Indonesia)

Project Leader	:	**MR. P. G. PUNCHIHEWA** **Executive Director** **Asia and Pacific Coconut Community (APCC)**
IDRC Grant	:	**$15,500 CAD**
Duration	:	**3 years**

The major objective of this project is to disseminate research-based information and technologies on palmwood utilization to potential end-users. In addition, the APCC will conduct a survey on the needs of potential users of coconut stem products. Likewise, a video documentary on the processing techniques and multiple uses of palmwood will be produced and distributed among potential end-users and entrepreneurs in its member countries. A bibliography on palmwood utilization is also being prepared for publication.

Socio--Economic Studies on Aren Utilization and Assessment of the Basic Properties of its Wood

Project Leader	:	**DR. NANA SUPRIANA** **Forest Products Research and Development Center (FPRDC)**
IDRC Grant	:	**$25,000 CAD**
Duration	:	**3 years**

The project on *Arenga* spp. (Aren) aims to assess and evaluate the properties of the *Arenga* palm stem. Likewise, the distribution, utilization and economic importance of Aren in rural communities as well as the

anatomical, physical and mechanical properties and durability are also being determined. Processing techniques such as drying, sawing and machining will be further studied to maximize the utilization of the Aren stem.

Tannin Adhesive from Palm Fruits (*Areca* spp.) (Philippines

Project Leader	:	**DR. ARMANDO VILLAFLOR** **Professor** **Department of Wood Science and Technology (UPLB)**
IDRC Grant	:	**$10,000 CAD**
Duration	:	**3 years**

Wood adhesives are expensive in developing countries. The betel nut is rich in tannin, but its chemistry is still unknown. The main objective of this study is to develop and test tannin-based wood adhesive from *Areca* spp. It was established, however, that the tannin content of *Areca* fruit ranges from 10 –13%, which is quite low for tannin adhesive production. Other uses of *Areca* will also be studied such as dentifrice and medicinal applications.

Prophylactic Treatment on Coconut Wood (Philippines)

Project Leader	:	**ENGR. ROLENDIO N. PALOMAR** **Philippine Coconut Authority (PCA)**
IDRC Grant	:	**$10,000 CAD**
Duration	:	**3 years**

The main objective of this study is to determine the effectiveness of various anti-sapstain chemicals for the protection of freshly-sawn coconut lumber against mold and staining fungi. Of the 16 fungicides studied, it appears that only two have potential ability to control mold and stain in coconut wood. These chemicals are the subject of further studies.

Anatomical Variation, Chemical, Physical and Mechanical Properties of Anahau [*Livistonis rotundifolia)* Lam) Mart. *var luzonensis* Becc.] and Buri [*Corypha elata* Roxb] Palmwood.

Proejct Leader	:	**MS. ZENITA B. ESPILOY** **Sr. Science Res. Specialist (FPRDI)**
IDRC Grant	:	**$5,000 CAD**
Duration	:	**3 years**

The main objective of this study is to determine the technological properties of two palm species – "buri" and "anahau" to assess their potential uses such as for construction, furniture and novelty items. Their increased utilization will augment the supply as well as help conserve the traditionally used timbers. Data on the anatomical, physico-mechanical and chemical properties are now being analyzed.

Sago Properties and Its Utilization (Indonesia)

Project Leader : **DR. T.A. PRAYITNO**
Faculty of Forestry
Gadja Mada University

IDRC Grant : **$25,000 CAD**
Duration : **2 years**

The current utilization of sago palm stems is for starch production. The outer portion of the trunk is used for fuelwood or left in the forest (as waste). The main objective of this study is to determine the potential economic uses of sago palm stem such as tool handles, construction materials and implements. The anatomical, physical and mechanical properties of the stem are likewise being studied

CONSULTANTS, PROJECT/STUDY LEADERS AND RESEARCHERS

Program Coordination

1. Program Coordinator	:	**Dr. Florentino O. Tesoro** *Director* *Forest Products Research and Development Institute*
2. Technical Adviser	:	**Mr. Wulf Killmann** *GTZ c/o FRIM*
3. Senior Program Officer (Forestry)	:	**Dr. Cherla B. Sastry** *International Development Research Centre*

Project 1 — Coconut Stem Utilization

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For. Pablico Alcachupas
Science Research Specialist II
Ms. Carolyn Marie Garcia
Science Research Specialist I
Ms. Antoinette Macias
Science Research Specialist I

Project 2 – Oil Palm Stem Utilization

Project Leader	:	**Dr. Salleh Mohd. Nor** *Director General* *FRIM*
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Project 3 - Other Palm Stem Utilization

Project Leader	**Dr. Buhnnum Kyokong** *Faculty of Forestry* *Kasetsart University*
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Project 4 — Dissemination of Information and Technology Transfer

Project Leader : **Mr. P. G. Punchihewa**
Executive Director
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SOLICITED PROJECTS:

Socio-Economic Studies on Aren Utilization and Assessment of the Basic Properties of its Wood (Bogor)

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Areca Tannin Adhesives

Project Leader : **Dr. Armando A. Villaflor**
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Project on Prophylactic Treatment on Coconut Wood

Project Leader : **Engr. Rolendio N. Palomar**
Phil. Coconut Authority

Anatomical Variation, Chemical, Physical and Mechanical Properties of Anahau [*Livistonia rotundifolia* (Lam.) Mart. *var. luzonensis* Becc.] and Buri *(Corypha elata* Roxb.) Palmwood.

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Project on *Sago* Properties and Its Utilization

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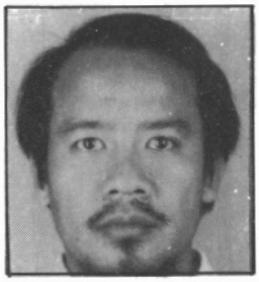

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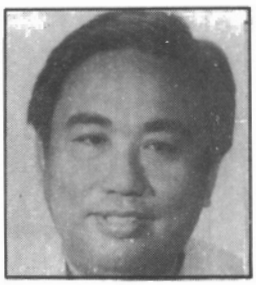

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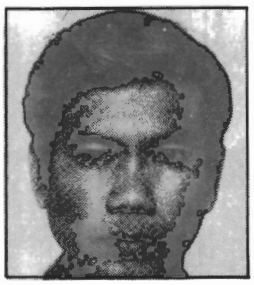

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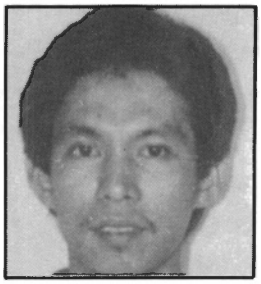

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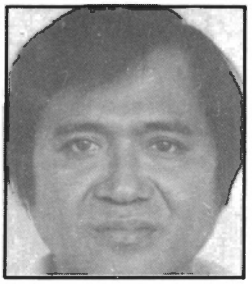

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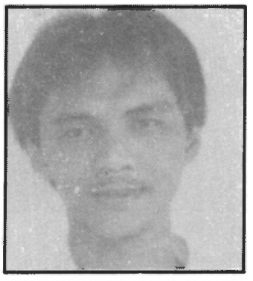

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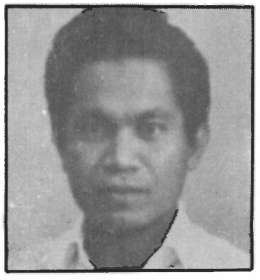

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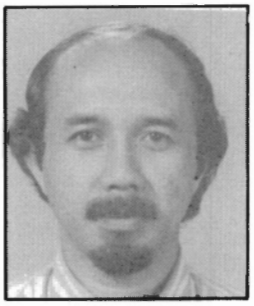

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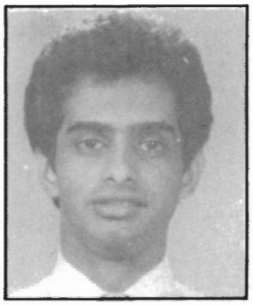

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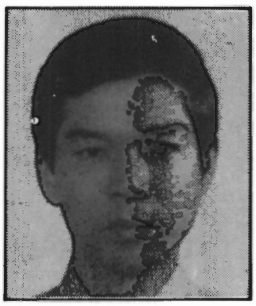

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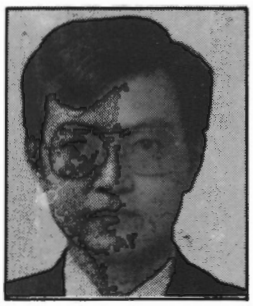

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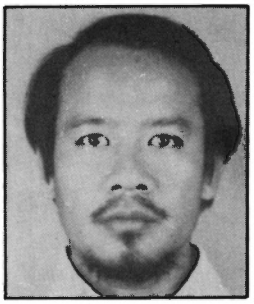

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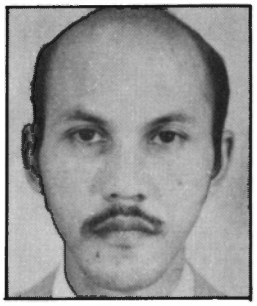

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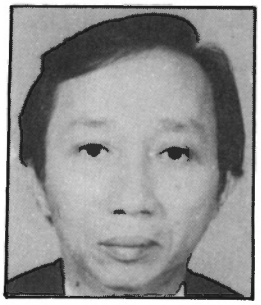

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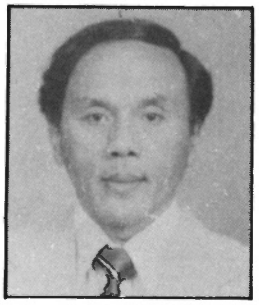

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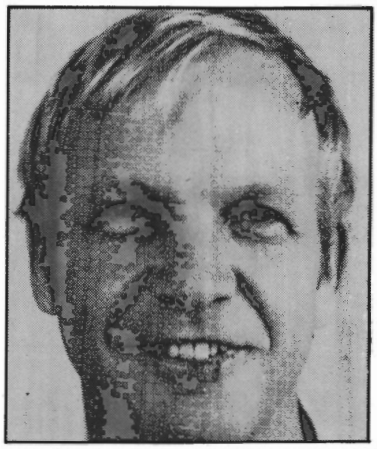

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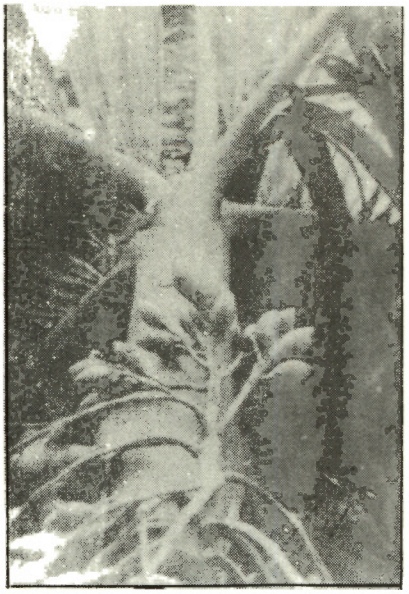

Bunga
(Areca catechu)

Sago palm
(Metroxylon sagu)

BACK COVER

1) **Buri** ***(Corypha elata*** Roxb.)
2) **Oil palm** ***(Elaeis guineensis)***
3) **Anahau** ***[Livistona rotundifolia*** (Lam.) ***var. luzonensis*** Becc.]
4) **Furniture from buri palm**
5) **Furniture from coconut wood**

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